



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

TIMOTHY C. OSTWALD et al.

Serial No.: 09/728,960

Filed: December 4, 2000

Group Art Unit: 2653

Examiner: Magee, Christopher R.

For: METHOD AND SYSTEM FOR ACCESSING
MULTIPLE ROWS OF MEDIA OBJECTS
IN AN AUTOMATED STORAGE LIBRARY USING A SINGLE TRACK

Attorney Docket No.: 00-082-TAP (STK 00082 PUS)

APPEAL BRIEF UNDER 37 C.F.R. § 1.192

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This is an appeal brief from the final rejection of claims 1-22 of the final Office
Action mailed March 12, 2004.

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I. REAL PARTY IN INTEREST

The real party in interest is Storage Technology Corporation, a corporation organized and existing under the laws of the state of Delaware, and having a place of business at One StorageTek Drive, MS-4309, Louisville, Colorado 80028-4309.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to the Applicant, the Applicant's legal representative, or the Assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 1-22 are pending in this application. Claims 1-22 (reproduced for reference in the attached Appendix) have been finally rejected and are the subject of this appeal. Of these claims, claims 1, 14-15, and 17 are the only independent claims.

IV. STATUS OF AMENDMENTS

There were no amendments after the final Office Action.

V. SUMMARY OF THE INVENTION

With reference to FIGS. 1-2 and page 7, line 15 through page 8, line 11 of the Applicant's specification, the claimed invention is directed to a storage library (10) for the storage and retrieval of media objects (18). The storage library (10) includes a frame (20). First and second horizontally arranged rows (31-32) of media object storage cells (16) are

arranged within the frame (20) in a common plane. Each of the media object storage cells (16) is for housing a media object (18). A horizontally arranged track (21) is attached to the frame (20) and is arranged in the common plane. The track (21) is disposed adjacent to the first row (31) of media object storage cells (16).

A robotic mechanism (12) is coupled to the track (21) for moving horizontally along the track (21). A media object manipulation mechanism (50) is coupled to the robotic mechanism (12). The media object manipulation mechanism (50) is vertically movable for moving between the first and second rows (31, 32) of media object storage cells (16) when the robotic mechanism (12) is coupled to the track (21) in order to manipulate the media objects (18) housed within the first and second rows (31, 32) of media object storage cells (16).

VI. ISSUE

The Examiner finally rejected claims 1-22 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,128,912 issued to Hug et al. ("Hug"). The issue on appeal is whether Hug anticipates claims 1-22.

VII. GROUPING OF CLAIMS

Claims 1-22 stand or fall together.

VIII. ARGUMENT

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as contained in the . . .

claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

1. Background of the Claimed Invention

As set forth in the Background Art section of the Applicant’s specification, a typical automated storage library includes horizontally arranged support tracks laid throughout the storage library. The tracks are positioned along horizontally arranged storage cell rows of the storage library in the same plane of the rows. Each storage cell row includes multiple media cartridge storage cells and each track is associated with a respective storage cell row.

Robotic mechanisms are mounted to respective tracks and are movable along the respective tracks for accessing the media cartridges held in the storage cells of the associated storage cell row. For example, a first robotic mechanism is mounted to a first track to access the media cartridges held in the storage cells of a first storage cell row, and a second robotic mechanism is mounted to a second track to access the media cartridges held in the storage cells of a second storage cell row. In a typical storage library, the first robotic mechanism is unable to access the media cartridges held in the storage cells of the second storage cell row. Likewise, the second robotic mechanism is unable to access the media cartridges held in the storage cells of the first storage cell row.

As such, if there are twelve storage cell rows then there will be twelve robotic mechanisms (one for each storage cell row). Each robotic mechanism is a relatively expensive high performance device. Accordingly, there will be a high cost associated with such a relatively large number of robotic mechanisms. What is desired is for a robotic mechanism mounted on one track to be able to service multiple storage cell rows.

2. The Claimed Invention

The claimed invention as recited in independent claims 1, 14-15, and 17 satisfies the above-described need. The claimed invention is generally directed to a storage library for the storage and retrieval of media objects. Independent claims 1 and 14 recite a storage library; independent claim 15 recites a robotic mechanism for a storage library; and independent claim 17 recites a method of operating a storage library.

As recited in representative independent claim 1, the storage library includes a frame. First and second horizontally arranged rows of media object storage cells are arranged within the frame in a common plane. Each of the media object storage cells is for housing a media object. A horizontally arranged track is attached to the frame and arranged in the common plane. The track is disposed adjacent to the first row of media object storage cells. A robotic mechanism is coupled to the track for moving horizontally along the track. A media object manipulation mechanism is coupled to the robotic mechanism. The media object manipulation mechanism is vertically movable for moving between the first and second rows of media object storage cells when the robotic mechanism is coupled to the track in order to manipulate the media objects housed within the first and second rows of media object storage cells.

Dependent claims 6 and 10 and independent claims 14-15 further recite that such horizontally arranged track(s), which are attached to the frame and arranged in the common plane of the rows of storage cells, are also disposed between the rows.

3. Hug

FIGS. 1-2 and 6-8; col. 4, lines col. 4, line 29 through col. 5, line 14; col. 7, lines 16-22; and col. 8, line 14 through col. 9, line 16 of Hug generally disclose the relevant

features of Hug. Hug generally discloses a storage library having two frames 12 and 14. Each frame has rows of media object cells within a frame. Hug also discloses two robotic mechanisms (i.e., "carriage assemblies") 26 and 28 for moving horizontally along the frames and vertically along the rows of the frames. Frames 12 and 14 and robotic mechanisms 26 and 28 generally have identical features so only one set of elements will be described in further detail.

Robotic mechanism 26 is supported for the horizontal and vertical movement by an overall carriage support arrangement 30. Support arrangement 30 includes a pair of horizontally arranged upper and lower tracks 32 which support a vertically extending post 36. Robotic mechanism 26 is movable vertically along post 36 and the post is horizontally movable along tracks 32.

Significantly, post 36, and hence robotic mechanism 26, is coupled to two tracks 32 and 34 in order to move horizontally. More significantly, Hug does not disclose or suggest that either of upper and lower tracks 32 are attached to frame 12. Lower track 32 appears to be attached to the floor or ground of a room in which the storage library is placed. (See FIG. 1.) Upper track 34 appears to be above the height of frame 12. (See FIGS. 1-2 and 6.) As such, upper track 34 may be intended to be attached to the ceiling of the room in which the storage library is placed. In any event, again, neither of upper and lower tracks 32 are attached to frame 12.

Furthermore, Hug discloses that upper and lower tracks 32 are placed in a space between the frames 12 and 14. As such, Hug does not disclose or suggest that either of tracks 32 are arranged in a common plane in which first and second rows are arranged within a frame.

4. The Claimed Invention Compared to Hug

The claimed invention, as recited in the independent claims, generally differs from Hug for the following reasons:

1. The horizontally arranged track is attached to the frame;
2. The track is arranged in the common plane in which the first and second rows of media object storage cells of the frame are arranged; and
3. The robotic mechanism is coupled to the track.

In contrast, Hug discloses:

1. Two horizontally arranged tracks 32. Neither of the tracks are attached to the frame 12;
2. The tracks are arranged in the space between two frames. As such, neither track is arranged in the common plane in which rows of the frame are arranged; and
3. The robotic mechanism 26 is coupled to two tracks 32 by a post 36. As such, the robotic mechanism is not coupled to the track.

Furthermore, the claimed invention as recited in dependent claims 6 and 10 and independent claims 14-15 differs from Hug in that the track(s) are also disposed between the rows of the frame. In contrast, Hug discloses the lower track 32 as being at the vertically height of the bottom row of a frame and, as such, does not disclose the lower track as being disposed between rows of one frame. (See FIG. 1 of Hug.) Hug discloses upper track 32 as being at a vertical height above the top row of a frame and, as such, does not disclose the upper track as being disposed between rows of one frame. (See FIGS. 1-2 and 6 of Hug.)

5. Applicant's Reply to Examiner's Response to Arguments

In the final Office Action, the Examiner quoted the Applicant's arguments made in the Amendment mailed February 11, 2004 as follows:

"The claimed invention generally differs from Hug in that in the claimed invention a track is attached to the frame of the storage library and is arranged in the common plane of the rows of storage cells which are arranged within the frame." and "As such, Hug does not teach or suggest horizontally arranged tracks disposed between rows of storage cells as recited in dependent claims 6 and 10 and amended independent claims 14-15."

The Examiner responded (and affirmed this response in the Advisory Action mailed June 17, 2004) by positing that FIG. 6 of Hug discloses that a component of storage library 10 is a frame and that, as shown in FIG. 6, the frame and tracks are arranged in a common plane. The Applicant notes that FIG. 6 is a side elevational view of the storage library 10 as shown in FIG. 1 of Hug. In FIG. 6, upper track 32 is shown as being offset to the left of frame 12. As such, FIG. 6 does not illustrate a track as being attached to the frame or arranged in the common plane of the storage cell rows of the frame as claimed.

The Examiner further responded (and affirmed this response in the Advisory Action) that FIGS. 1 and 6 illustrate the tracks 32 and 34 of Hug as being disposed between the rows of storage cells 12 and 14. The Applicant notes that FIGS. 1 and 6 illustrate the tracks 32 and 34 as being disposed in the space between storage libraries 12 and 14. As such, FIGS. 1 and 6 do not illustrate the tracks 32 and 34 as being disposed between the rows of one storage library, i.e., between the rows of the frame as provided by the claimed invention.

Thus, the claimed invention as set forth in independent claims 1, 14-15, and 17 is patentable under 35 U.S.C. § 102(b) over Hug. Claims 2-13, 16, and 18-22 depend from

one of the independent claims and include the limitations therein. Thus, claims 2-13, 16, and 18-22 are patentable under 35 U.S.C. § 102(b) over Hug.

IX. SUMMARY

For the reasons discussed above, the Applicant respectfully submits that claims 1-22 are patentable under 35 U.S.C. § 102(b) over Hug.

Respectfully submitted,

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Enclosure - Appendix



APPENDIX - CLAIMS ON APPEAL

1. A storage library for the storage and retrieval of media objects, the storage library comprising:

a frame;

first and second horizontally arranged rows of media object storage cells arranged within the frame in a common plane, each of the media object storage cells for housing a media object;

a horizontally arranged track attached to the frame and arranged in the common plane, the track being disposed adjacent to the first row of media object storage cells;

a robotic mechanism coupled to the track for moving horizontally along the track; and

a media object manipulation mechanism coupled to the robotic mechanism, wherein the media object manipulation mechanism is vertically movable for moving between the first and second rows of media object storage cells when the robotic mechanism is coupled to the track in order to manipulate the media objects housed within the first and second rows of media object storage cells.

2. The storage library of claim 1 wherein:

the media object manipulation mechanism is a gripper mechanism.

3. The storage library of claim 1 wherein:

the media object manipulation mechanism is vertically movable to move from the first row of media object storage cells to the second row of media object storage cells.

4. The storage library of claim 3 wherein:

the media object manipulation mechanism is vertically movable to move from the second row of media object storage cells back to the first row of media object storage cells.

5. The storage library of claim 1 further comprising:

a third horizontally arranged row of media object storage cells arranged within the frame in the common plane, wherein the media object manipulation mechanism is vertically movable for moving between the first, second, and third rows of media object storage cells in order to manipulate the media objects housed within the first, second, and third rows of media object storage cells.

6. The storage library of claim 1 wherein:

the track is disposed between the first and second rows of media object storage cells.

7. The storage library of claim 1 wherein:

the second row of media object storage cells is below the first row of media object storage cells and the track is disposed above the first row of media object storage cells.

8. The storage library of claim 1 wherein:

the media objects include media cartridges.

9. The storage library of claim 1 wherein:

the media objects include media players.

10. The storage library of claim 1 further comprising:

third and fourth horizontally arranged rows of media object storage cells arranged within the frame in the common plane, each of the media object storage cells for housing a media object;

a second horizontally arranged track attached to the frame and arranged in the common plane, the second track being disposed between the second and third rows of media object storage cells; and

a second robotic mechanism coupled to the second track for moving horizontally along the second track; and

a second media object manipulation mechanism coupled to the second robotic mechanism, wherein the second media object manipulation mechanism is vertically movable for moving between the third and fourth rows of media object storage cells when the second robotic mechanism is coupled to the second track in order to manipulate the media objects housed within the third and fourth rows of media object storage cells.

11. The storage library of claim 10 wherein:

the second media object manipulation mechanism is vertically movable for moving between the second and third rows of media object storage cells when the second robotic mechanism is coupled to the second track to manipulate the media objects housed within the second and third rows of media object storage cells.

12. The storage library of claim 1 wherein:

the media object manipulation mechanism directly moves vertically between the first and second rows of media object storage cells.

13. The storage library of claim 1 wherein:

the media object manipulation mechanism rotates to move vertically between the first and second rows of media object storage cells.

14. A storage library for the storage and retrieval of media objects, the storage library comprising:

a frame;

first, second, and third horizontally arranged parallel rows of media object storage cells arranged within the frame in a common plane, the second row of media object storage cells disposed between the first and third rows of media object storage cells, each of the media object storage cells for housing a media object;

a first track attached to the frame and arranged in the common plane, the first track being disposed adjacent to the first row of media object storage cells;

a second track attached to the frame and arranged in the common plane, the second track being disposed between the first and second rows of media object storage cells;

a first robotic mechanism coupled to the first track for moving horizontally along the first track, the first robotic mechanism having a first media object manipulation mechanism vertically movable for moving between the first and second rows of media object storage cells in order to manipulate the media objects housed within the first and second rows of media object storage cells; and

a second robotic mechanism coupled to the second track for moving horizontally along the second track, the second robotic mechanism having a second media object manipulation mechanism vertically movable for moving between the second and third rows of media object storage cells in order to manipulate the media objects housed within the second and third rows of media object storage cells.

15. A robotic mechanism for an automated storage library having first and second rows of media object storage cells arranged within a frame in a common plane, the robotic mechanism comprising:

a media object manipulation mechanism; and

a carriage for coupling to a track attached to the frame, arranged in the common plane, and disposed between the first and second rows of media object storage cells to move

the media object manipulation mechanism along the track, wherein the media object manipulation mechanism is vertically movable in order to manipulate media objects housed above and below the track in the first and second rows of media object storage cells of the automated storage library.

16. The storage library of claim 15 further comprising:

a carousel associated with the media object manipulation mechanism for rotating the gripper mechanism to be vertically movable.

17. A method of operating a storage library having first and second horizontally arranged rows of media object storage cells arranged within a frame in a common plane, each of the media object storage cells for housing a media object, and a horizontally arranged track attached to the frame, arranged in the common plane, and disposed adjacent to the first row of media object storage cells, the method comprising:

coupling a robotic mechanism to the track such that the robotic mechanism is attached to the frame by the track for horizontal movement along the track; and

vertically moving a media object manipulation mechanism coupled to the robotic mechanism between the first and second rows of media object storage cells when the robotic mechanism is coupled to the track; and

manipulating the media objects housed within the first and second rows of media object storage cells with the media object manipulation mechanism after the media object manipulation mechanism has been vertically moved.

18. The method of claim 17 wherein:

vertically moving the media object manipulation mechanism includes vertically moving the media object manipulation mechanism from the first row of media object storage cells to the second row of media object storage cells.

19. The method of claim 18 wherein:

vertically moving the media object manipulation mechanism includes vertically moving the media object manipulation mechanism from the second row of media object storage cells back to the first row of media object storage cells.

20. The method of claim 17 wherein the storage library includes a third horizontally arranged row of media object storage cells arranged within the frame in the common plane, wherein:

vertically moving the media object manipulation mechanism includes vertically moving the media object manipulation mechanism between the first, second, and third rows of media object storage cells in order to manipulate the media objects housed within the first, second, and third rows of media object storage cells.

21. The method of claim 17 wherein:

vertically moving the media object manipulation mechanism includes directly moving the media object manipulation mechanism vertically between the first and second rows of media object storage cells.

22. The method of claim 17 wherein:

vertically moving the media object manipulation mechanism includes rotating the media object manipulation mechanism to move vertically between the first and second rows of media object storage cells.